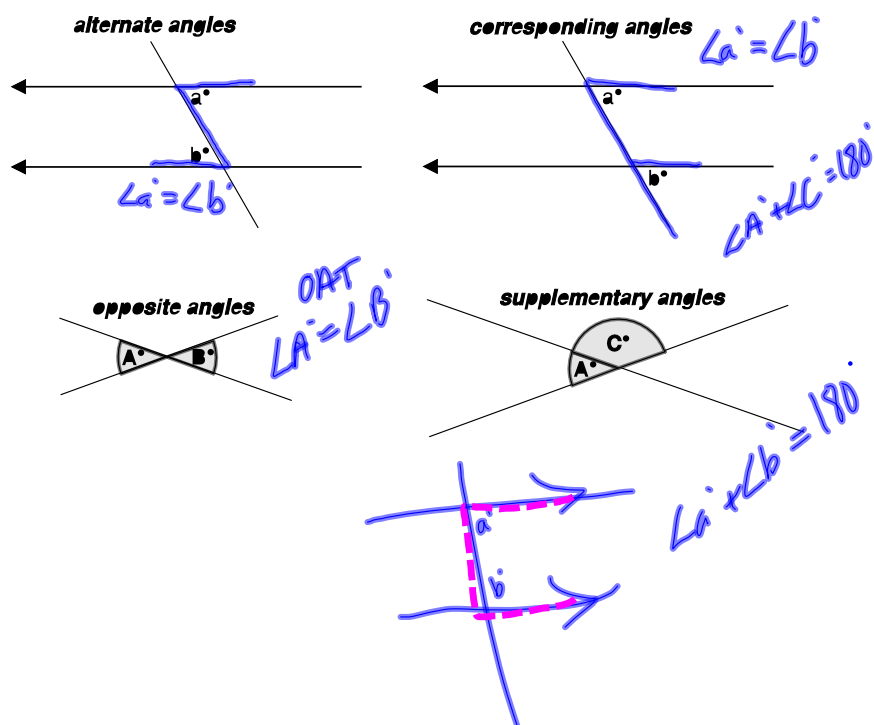


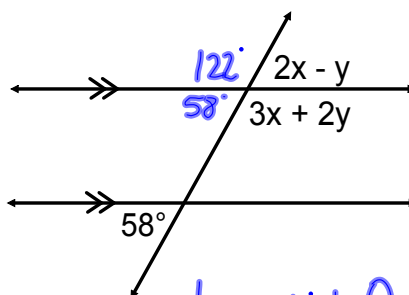
### L9 - Applications of Linear Systems: Geometry, Money and Number Problems

Recall:



Ex.1. Determine the value of  $x$  and  $y$ .

$$\begin{aligned}
 & \textcircled{1} (2x - y = 58) \times 2 \\
 & \textcircled{2} 3x + 2y = 122 \\
 & \textcircled{1} 4x - 2y = 116 \\
 & + \textcircled{2} 3x + 2y = 122 \\
 & \hline
 & 7x = 238 \\
 & \frac{7x}{7} = \frac{238}{7} \\
 & x = 34
 \end{aligned}$$



$$\begin{aligned}
 & \text{Sub } x = 34 \text{ into } \textcircled{1} \\
 & 4x - 2y = 116 \\
 & 4(34) - 2y = 116 \\
 & y = 10 \\
 & \therefore x = 34 \text{ and } y = 10
 \end{aligned}$$

Ex. 2) The coin box of a vending machine contains half as many quarters as dimes. If the total value of the coins is \$22.50, how many dimes are there?

$$\textcircled{1} (0.25q + 0.10d = 22.50) \times 100$$

$$\textcircled{2} d = 2q \text{ or } q = \frac{d}{2}$$

Sub ② into ①

$$25q + 10\left(\frac{q}{2}\right) = 2250$$

$$25q + 20q = 2250$$

$$\frac{45q}{45} = \frac{2250}{45}$$

$$q = 50$$

dimes = 0.10  
nickels = 0.05  
quarters = 0.25

Sub  $q = 50$  into ②

$$d = 2(50)$$

$$d = 100$$

$\therefore$  there are 50 quarters & 100 dimes

Ex. 3) A rectangle with a perimeter of 180 cm is four times longer than it is wide. What are the dimensions of the rectangle?

$$\textcircled{1} l = 4w$$

$$\textcircled{2} 2l + 2w = 180$$

let  $l$  represent length  
let  $w$  represent width

ANS

$$w = 18$$

$$l = 72$$

$\therefore$  the length is 72cm & the width is 18cm

Ex. 4) The sum of two numbers is 72. Their difference is 48. Find the numbers.

let  $x$  represent the 1<sup>st</sup> number  
let  $y$  represent the 2<sup>nd</sup> number

$$\textcircled{1} \quad x + y = 72$$

$$\textcircled{2} \quad x - y = 48$$

ANS

1<sup>st</sup> 60  
2<sup>nd</sup> 12

### Assigned Work:

- 1) Erik has \$4.80 in nickels and quarters. If he has 6 more nickels than quarters, how many of each does he have?
- 2) Hakim invested \$15 000. He put part of it in a term deposit that paid 4% per year and the remainder in a Canadian bond that paid 5% per year. After one year, the total interest was \$690. How much did Hakim invest at each rate?
- 3) The Student Council held a car wash to raise money. They washed cars for \$5 each and vans for \$7 each. They washed 45 vehicles and earned \$243. How many of each type of vehicle did they wash?

equations: 1)  $0.05x + 0.25y = 4.80$   
 $x - y = 6$

2)  $0.04x + 0.05y = 690$   
 $x + y = 15000$

3)  $5x + 7y = 243$   
 $x + y = 45$

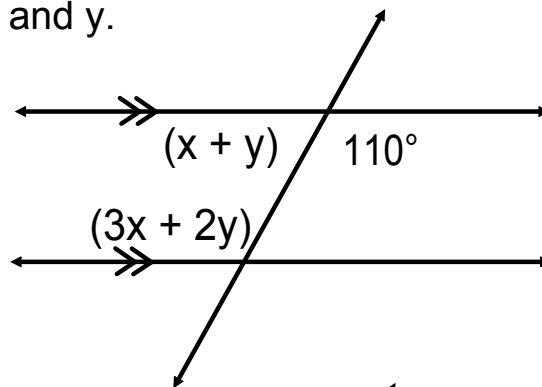
- 4) Two persons share a lottery worth \$1200. One person received \$800 less than 3 times what the other person received. How much did each person receive?
- 5) Wilfrid has a total of 23 dimes and quarters. The total value amounts to \$2.90. How many coins of each kind does he have?
- 6) In the good old days, ice cream cones cost 20 cents for a single scoop and 35 cent for a double scoop. If a vendor sold \$30 worth of ice cream in a ratio of 2:1 single to double scoops, how many of each kind did he sell?

Answers: 4)  $x + y = 1200$   
 $y = 3x - 800$   
 $x = 500$  &  $y = 700$

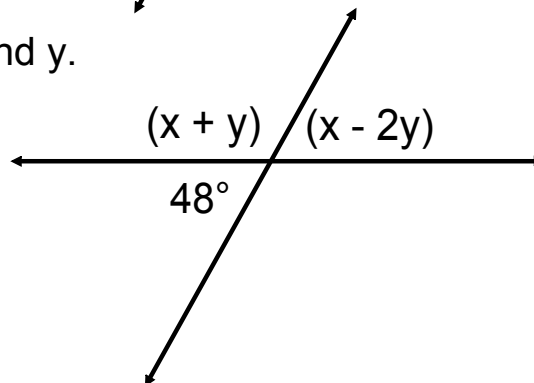
5)  $x + y = 23$   
 $0.25x + 0.10y = 2.90$   
 $x = 4$  &  $y = 19$

6)  $0.20x + 0.35 = 30$   
 $x = 2y$   
 $x = 80$  &  $y = 40$

- 7) Determine the value of  $x$  and  $y$ .



- 8) Determine the value of  $x$  and  $y$ .



Also p. 40 #17\* and p. 55 #9

Review for Test: p. 62 #5a, 6, 7bc, 9, 12acd, 13, 14, 16, 17, 18